Complete Summary

TITLE

Selected infections (area-level): rate per 100,000 population.

SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [revision 1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 May 28. 143 p. (AHRQ Pub; no. 03-R203).

Brief Abstract

DESCRIPTION

This measure assesses the number of cases of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes 9993 or 99662 per 100,000 population.

RATIONALE

Patient safety is an issue of major national interest. Policymakers, providers, and consumers have made the safety of care in United States hospitals a top priority. The need to assess, monitor, track, and improve the safety of inpatient care became apparent with publication of the Institute of Medicine's series of reports describing the problem of medical errors. As our health care system becomes more complex, the possibility of significant unintended adverse effects increases.

Patient Safety Indicators (PSIs), which are based on computerized hospital discharge abstracts from the AHRQ's Healthcare Cost and Utilization Project (HCUP), can be used to better prioritize and evaluate local and national initiatives. Analyses of these and similar inexpensive, readily available administrative data sets may provide a screen for potential medical errors and a method for monitoring trends over time.

This indicator is intended to flag cases of infection due to medical care, primarily those related to intravenous (IV) lines and catheters. This indicator is defined both on a hospital level (by including cases based on secondary diagnosis associated with the same hospitalization) (see Selected infections (hospital-level): rate per 1,000 discharges) and on an area level (by including all cases of such infection). Patients with potentially immunocompromised states (e.g., AIDS, cancer, transplant) are excluded, as they may be more susceptible to such infection.

This indicator includes children and neonates. It should be noted that high-risk neonates are at particularly high risk for catheter-related infections.

PRIMARY CLINICAL COMPONENT

Intravenous (IV) lines and catheters; infection

DENOMINATOR DESCRIPTION

Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location.

NUMERATOR DESCRIPTION

Discharges with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of 9993 or 99662 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs).

Exclude patients with any diagnosis code for immunocompromised state or cancer.

Evidence Supporting the Measure

PRIMARY MEASURE DOMAIN

Outcome

SECONDARY MEASURE DOMAIN

Not applicable

EVIDENCE SUPPORTING THE MEASURE

A formal consensus procedure involving experts in relevant clinical, methodological, and organizational sciences
One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Unspecified

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Federal health policymaking
National health care quality reporting
State health policymaking

CARE SETTING

Hospitals

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Nurses
Public Health Professionals

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Counties or Cities

TARGET POPULATION AGE

Unspecified

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

Based on the 1997 Healthcare Cost and Utilization Project (HCUP) State Inpatient Database for 19 States, the Selected Infections Due to Medical Care (Area-Level) rate was 34.18 per 100,000 population.

EVIDENCE FOR INCIDENCE/PREVALENCE

AHRQ quality indicators. Guide to patient safety indicators [revision 1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 May 28. 143 p. (AHRQ Pub; no. 03-R203).

ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

BURDEN OF ILLNESS

Based on the matching analysis of the 2000 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) data reported by Zhan and Miller, selected infections due to medical care were associated with an excess length of stay of 9.58 days, excess charges of $38,656, and an excess mortality rate of 4.31%.

EVIDENCE FOR BURDEN OF ILLNESS

Zhan C, Miller MR. Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. JAMA 2003 Oct 8;290(14):1868-74. PubMed

UTILIZATION

See "Burden of Illness" field.

COSTS

See "Burden of Illness" field.

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Getting Better

IOM DOMAIN

Safety

Data Collection for the Measure

CASE FINDING

Both users and nonusers of care

DESCRIPTION OF CASE FINDING

Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location.

DENOMINATOR SAMPLING FRAME

Geographically defined

DENOMINATOR (INDEX) EVENT

Patient Characteristic

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions
Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location.

Exclusions
Unspecified

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions
Discharges with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of 9993 or 99662 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs). Refer to Appendix A of the original measure documentation for DRGs.

Exclusions
Exclude patients with any diagnosis code for immunocompromised state or cancer. Refer to Appendix A of the original measure documentation for ICD-9-CM codes and DRGs.

DENOMINATOR TIME WINDOW

Time window is a single point in time

NUMERATOR TIME WINDOW

Institutionalization

DATA SOURCE

Administrative data
National public health data

LEVEL OF DETERMINATION OF QUALITY

Not Individual Case

OUTCOME TYPE

Adverse Outcome

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

Better quality is associated with a lower score

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

The Patient Safety Indicators (PSIs) were evaluated by the project team using empirical analyses to explore the frequency and variation of the indicators, the potential bias, based on limited risk adjustment, and the relationship between indicators. The data sources used in the empirical analyses were the 1997 Florida State Inpatient Database (SID) for initial testing and development and the 1997 Healthcare Cost and Utilization Project (HCUP) State Inpatient Database for 19 States for the final empirical analyses.

All potential indicators were examined empirically by developing and conducting statistical tests for precision, bias, and relatedness of indicators. Three different estimates of hospital performance were calculated for each indicator:

1. The raw indicator rate was calculated using the number of adverse events in the numerator divided by the number of discharges in the population at risk by hospital.
2. The raw indicator was adjusted to account for differences among hospitals in age, gender, modified Diagnosis-Related Group (DRG), and comorbidities.
3. Multivariate signal extraction methods were applied to adjust for reliability by estimating the amount of "noise" (i.e., variation due to random error) relative to the amount of signal (i.e., systematic variation in hospital performance or reliability) for each indicator.

Refer to the original measure documentation for additional details.

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to patient safety indicators [revision 1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 May 28. 143 p. (AHRQ Pub; no. 03-R203).

Identifying Information

ORIGINAL TITLE

Selected infections due to medical care (area level definition).

MEASURE COLLECTION

Agency for Healthcare Research and Quality (AHRQ) Quality Indicators

MEASURE SET NAME

Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators

DEVELOPER

Agency for Healthcare Research and Quality

INCLUDED IN

National Healthcare Quality Report (NHQR)

ADAPTATION

This indicator was originally proposed by Iezzoni and colleagues (1994) as part of the Complications Screening Program (CSP) (CSP 11, "miscellaneous complications"). The University HealthSystem Consortium adopted the CSP indicator for major (#2933) and minor (#2961) surgery patients. A much narrower definition, including only 9993 ("other infection after infusion, injection, transfusion, vaccination") was proposed by Miller and colleagues (2001) in the "Patient Safety Indicator Algorithms and Groupings." The American Nurses Association (1999) and its State associations have identified the number of laboratory-confirmed bacteremic episodes associated with central lines per critical care patient day as a "nursing-sensitive quality indicator for acute care settings."

RELEASE DATE

2003 Mar

REVISION DATE

2003 May

MEASURE STATUS

This is the current release of this measure.

SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [revision 1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 May 28. 143 p. (AHRQ Pub; no. 03-R203).

MEASURE AVAILABILITY

The individual measure, "Selected Infections Due to Medical Care (Area Level Definition)," is published in "AHRQ Quality Indicators. Guide to Patient Safety Indicators." This document is available in Portable Document Format (PDF) and a zipped WordPerfect(R) file from the Quality Indicators page at the Agency for Healthcare Research and Quality (AHRQ) Web site.

For more information, please contact the QI Support Team at support@qualityindicators.ahrq.gov.

COMPANION DOCUMENTS

The following are available:

- "AHRQ Patient Safety Quality Indicators Software (Version 2.1)" (Rockville, [MD]: AHRQ, 2003 Mar 13) and its accompanying documentation an be downloaded from the Agency for Healthcare Research and Quality (AHRQ) Web site. (The software is available in both SAS- and SPSS-compatible formats.)
- Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available from the AHRQ Web site.
- "HCUPnet, Healthcare Cost and Utilization Project" [internet]. (Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 [Various pagings]). HCUPnet is available from the AHRQ Web site.
- "Refinement of the HCUP Quality Indicators" (Rockville [MD]: AHRQ, 2001 May. Various pagings. [Technical review; no. 4]; AHRQ Publication No. 01-0035). This document was prepared by the UCSF-Stanford Evidence-based Practice Center for AHRQ and can be downloaded from the AHRQ Web site.

NQMC STATUS

This NQMC summary was completed by ECRI on October 1, 2003. The information was verified by the measure developer on October 29, 2003.

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